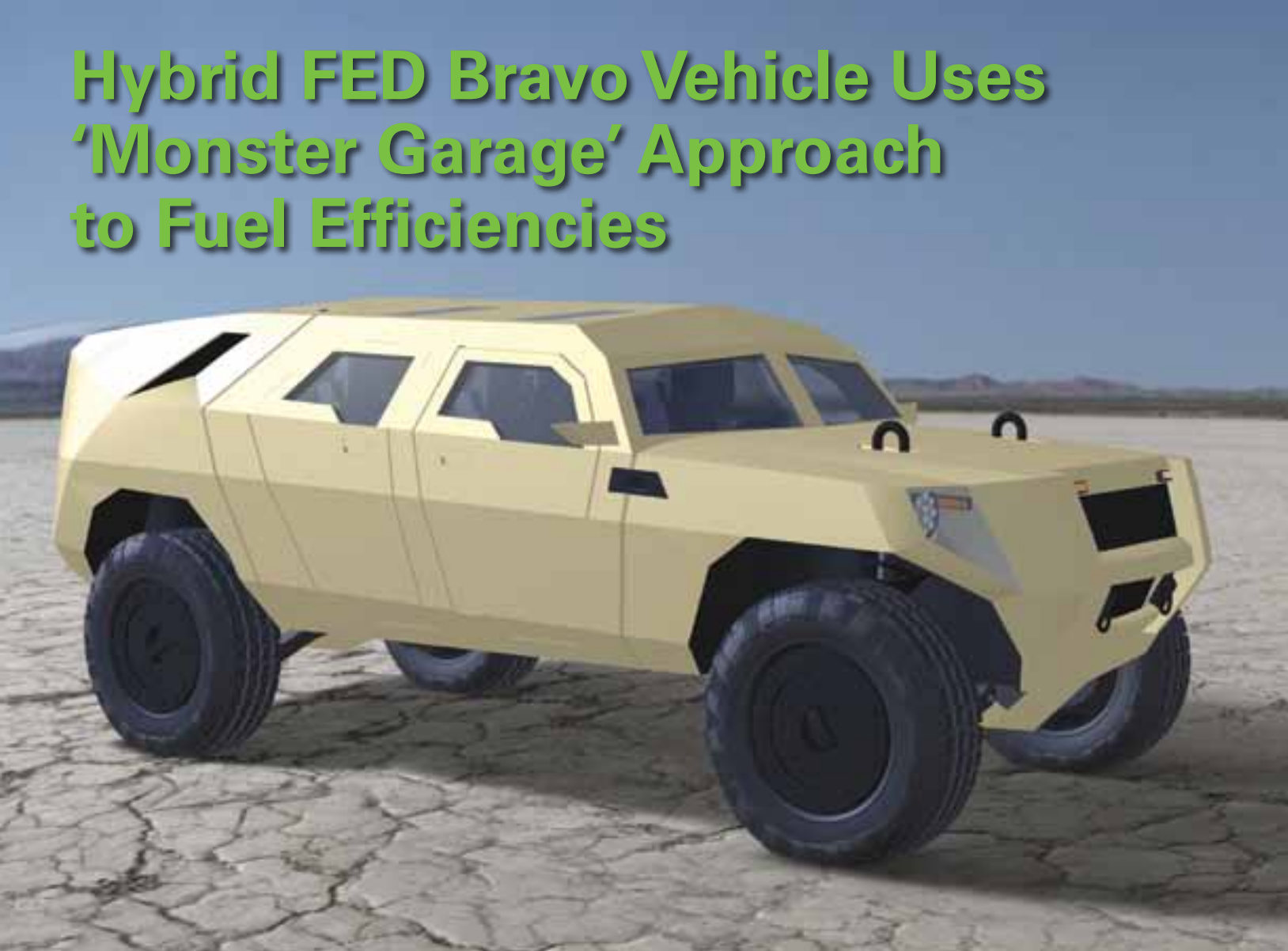


Hybrid FED Bravo Vehicle Uses ‘Monster Garage’ Approach to Fuel Efficiencies



from several companies for each system on the vehicle.

- ▶ The final design review was held in September. Fabrication was scheduled for late 2010.
- ▶ Vehicle assembly is scheduled to take place in early 2011.
- ▶ Engineers will conduct final calibration and

tuning of components and systems next summer.

- ▶ Shake-out testing, followed by full test mode, will happen during the second half of 2011.
- ▶ Once the technology on the FED Bravo passes evaluation, it can be exported to other military platforms to improve fuel efficiency and performance.

Editor's Note: The artist renderings on pages 28 and 29 are the FED Bravo vehicle by CCS student Joel Zastrow.



Veering slightly but deliberately from the conventional engineering path can yield innovative results. Designers adopted a ‘Monster Garage’ approach for Fuel Efficient Ground Vehicle Demonstrator (FED) Bravo to take advantage of the former television show’s brainstorming dynamic.

The ‘Monster Garage’ television series, which aired from 2002 to 2006 on the Discovery Channel, gathered a team of experts from different disciplines and turned them loose to convert an average vehicle into something extraordinary. In the FED team’s case, they simply wanted to borrow the creative process from

the show’s format, which included assembling the talent for the development team, encouraging the open flow of ideas, and departing from traditional engineering methods. The ‘Monster Garage’ gang might turn a New York City hot dog cart into a dragster, but the FED team focused on designing an Army ground vehicle that would achieve much higher fuel efficiencies.

This demonstrator vehicle is nearing the end of development and the beginning of its production phase. This will be the second FED vehicle created for this project, which will potentially transfer technological and structural design features to existing vehicles and Future Force vehicles.

Here are a few FED Bravo key points:

- ▶ This program has been orchestrated by TARDEC working with private World Technical Services Inc. (WTSI).
- ▶ Program leaders gathered government, private industry and academic resources from around the country to address the issues of fuel economy and logistics impact.
- ▶ The first project phase used a ‘Monster Garage’ approach to gather ideas and input. The second phase leveraged those results by assigning TARDEC and WTSI engineers to design the vehicle.
- ▶ The team reviewed technological contributions

COLLABORATION LEADS TO WELL-ENGINEERED SOLUTIONS

ELECTRICAL ARCHITECTURE

TruckLite provided the electrical architecture for the WTSI FED Bravo vehicle. The hybrid-electric system will include a DC-DC converter that will deliver about 4 kilowatts (kW) of power to the low-voltage electrical system. By integrating light-emitting diode, or LED, lighting, WTSI can reduce the current draw on the vehicle’s low-voltage battery, and power can be conserved in the vehicles overall electrical system.

DASHBOARD

Medallion Instrumentation Systems designed a dashboard that follows

commercial truck design rather than a typical military instrumentation panel. Medallion’s custom gauge cluster has form and function — attractive while still displaying mission critical information.

BRAKES

The WTSI FED Bravo vehicle is using a MICO Full Power Hydraulic Brake System with ABS. The MICO system was designed to handle up to eight channels of HABS control and can support J1939 protocol. Additionally, the system is able to be combined with the steering system to supply the hydraulic demands of the

steering rack to eliminate a second pump, providing a more efficient solution at the vehicle level.

SEATS

Blast mitigation seats were designed by Jankel Tactical Systems LLC. They feature automatic weight adjustment and a function that resets the seat location should it go airborne, in a manner that increases passenger survivability.